

1966 OPERATING SUMMARY

STREETSVILLE

water pollution control plant

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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

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ONTARIO WATER RESOURCES COMMISSION
OFFICE OF THE GENERAL MANAGER

Members of the Streetsville Local Advisory Committee,
Town of Streetsville.

Gentlemen:

We are pleased to submit to you the 1966 Operating Summary for the
Streetsville Water Pollution Control Plant, OWRC Project No. 57-S-5.

It is hoped that our joint participation in efforts to combat water pollution
will have even more success in the coming year.

Yours very truly,

A handwritten signature in dark ink, appearing to read "D. S. Caverly", is written over the typed name and title.

D. S. Caverly,
General Manager.



ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET
TORONTO 5

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VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER

W. S. MACDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission,

Dear Sir:

I am happy to present you with the 1966 Operating Summary for the Streetsville Water Pollution Control Plant, OWRC Project No. 57-S-5.

The report offers a concise summary of operating data for the year and comparisons with previous years where these are applicable and significant.

Yours very truly,

A handwritten signature in cursive script, appearing to read "B. C. Palmer".

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

● This operating summary contains complete information on the management of the project during 1966. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

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STREETSVILLE water pollution control plant

operated for

THE TOWN OF STREETSVILLE

by the

ONTARIO WATER RESOURCES COMMISSION

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| Assistant Director: | C. W. Perry |
| Regional Supervisor: | A. C. Beattie |
| Operations Engineer: | A. Clark |

801 Bay Street Toronto 5

'66 REVIEW

A total of 199.5 million gallons was treated in 1966. This is an average daily flow of 0.55 million gallons.

The flows did not change greatly from 1965. The probability of flow graph shows that the plant was hydraulically overloaded ten percent of the time.

The overall cost per million gallons increased by 13.5 percent from the previous year, largely due to the increase in the amount spent on sludge haulage and increased chlorine usage.

There were seasonal problems caused by the canning factories in town.

The quality of the effluent was good, and generally within OWRC objectives of 15 ppm BOD and SS.

PROJECT STAFF

During the early part of 1966, the process was controlled by one operator and casual labour, but in the fall, a part-time operator was hired to assist the full-time operator in his duties. The plant is under supervision 8 a.m. - 4 p.m. Monday to Friday, plus Saturday and Sunday mornings.

There were regular inspections by the operations engineer and his assistant.

The maintenance section made seven visits during the year, mostly to effect equipment repairs. There were no recorded visits by the Special Services Section. The Safety Officer made an inspection in 1966.

The plant machinery, with the exception of the digester mixer, is mechanically sound. Wooden doors and brickwork, however, have deteriorated and will need replacement.

PROJECT COSTS

| | |
|---|---------------------|
| NET CAPITAL COST (Final) | \$310,937.98 |
| DEDUCT - Payments from Municipalities | <u>30,000.00</u> |
| Long Term Debt to OWRC | <u>\$280,937.98</u> |
| Debt Retirement Balance at Credit (Sinking Fund) December 31, 1966 | \$ <u>55,985.15</u> |
| Net Operating | \$ 16,479.72 |
| Debt Retirement | 5,669.00 |
| Reserve | 1,493.94 |
| Interest Charged | 15,806.19 |
| TOTAL | \$ <u>39,448.85</u> |

RESERVE ACCOUNT

| | |
|------------------------------|---------------------|
| Balance at January 1, 1966 | \$ 19,793.97 |
| Deposited by Municipality | 1,493.94 |
| Interest Earned | <u>1,128.20</u> |
| | \$ 22,416.11 |
| Less Expenditures | - |
| Balance at December 31, 1966 | \$ <u>22,416.11</u> |

MONTHLY OPERATING COSTS

| MONTH | TOTAL EXPENDITURE | PAYROLL | CASUAL PAYROLL | FUEL | POWER | CHEMICAL | GENERAL SUPPLIES | EQUIPMENT | REPAIRS & MAINTENANCE | * SUNDRY | WATER |
|-------|-------------------|---------|----------------|--------|---------|----------|------------------|-----------|-----------------------|----------|--------|
| JAN | 968.51 | 406.62 | 126.74 | 24.90 | 134.58 | | 29.19 | | 19.90 | 207.00 | 26.68 |
| FEB | 865.70 | 348.58 | 167.66 | 35.58 | 126.28 | | 8.71 | 7.70 | | 155.08 | 16.11 |
| MARCH | 655.77 | 399.66 | | 46.14 | 120.87 | | 14.95 | | 10.30 | 58.66 | 5.17 |
| APRIL | 1437.58 | 761.35 | 135.27 | 70.02 | 130.00 | 276.01 | 24.02 | | 18.90 | 5.00 | 17.01 |
| MAY | 1101.16 | 469.88 | 77.07 | 51.06 | 126.96 | | 25.40 | | | 326.36 | 24.43 |
| JUNE | 1771.91 | 536.92 | 157.95 | 59.34 | 124.75 | | 70.29 | 22.63 | | 774.92 | 25.11 |
| JULY | 1213.48 | 304.14 | 225.18 | 54.44 | 125.44 | 276.93 | 93.07 | | 8.90 | 22.12 | 28.26 |
| AUG | 1509.00 | 411.01 | 262.58 | 47.72 | 130.84 | 109.06 | 5.50 | | | 510.78 | 31.41 |
| SEPT | 1404.92 | 622.06 | 130.69 | 96.16 | 120.19 | | 16.14 | | 5.26 | 389.21 | 24.21 |
| OCT | 1411.73 | 411.01 | 47.31 | 67.04 | 124.76 | 276.93 | 27.26 | | | 349.06 | 108.36 |
| NOV | 1331.38 | 407.65 | 40.25 | 50.96 | 124.76 | 228.38 | 14.78 | 172.46 | 211.42 | 36.04 | 44.66 |
| DEC | 2603.53 | 436.94 | 214.94 | 153.73 | 122.53 | 46.55 | 52.02 | | 121.03 | 1618.11 | 35.63 |
| TOTAL | 16479.72 | 5596.94 | 1585.74 | 757.09 | 1511.95 | 1215.86 | 374.23 | 202.79 | 390.56 | 4452.34 | 387.11 |

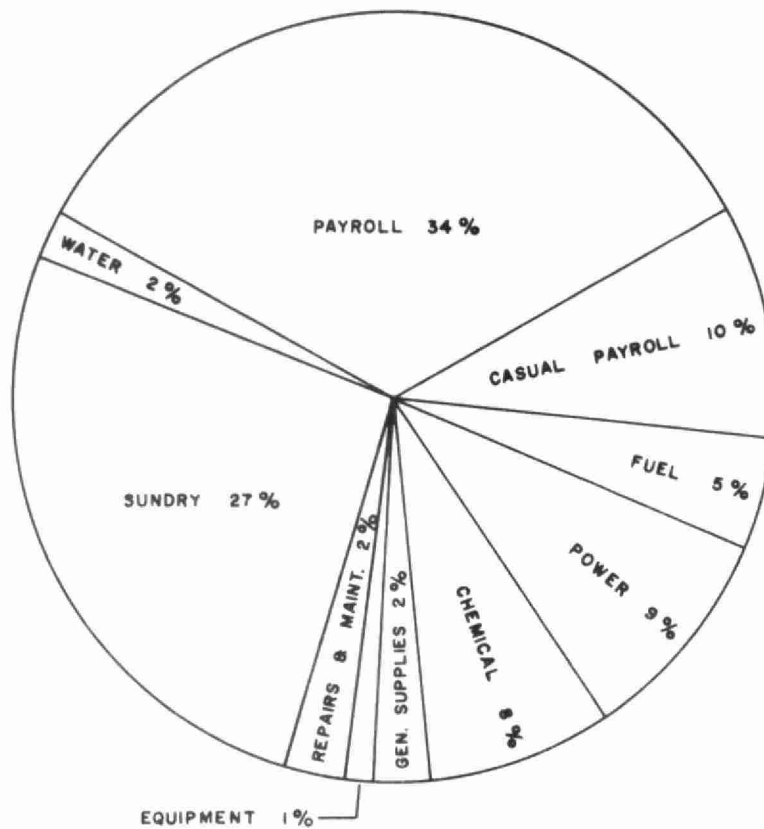
* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$3,743.40

YEARLY OPERATING COSTS

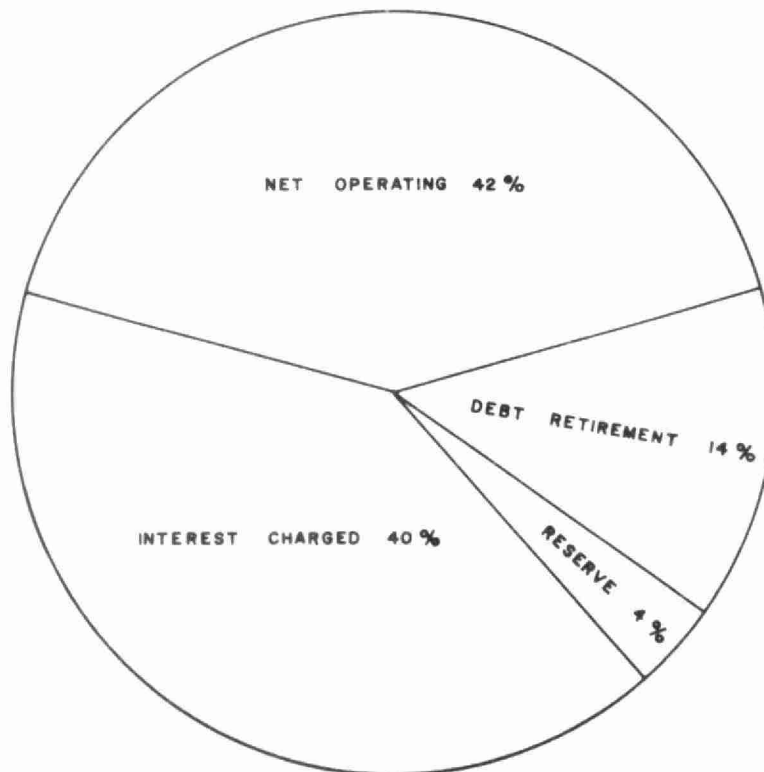
| YEAR | M.G. TREATED | TOTAL COST | COST PER FAMILY PER YEAR | COST PER MILLION GALLONS | COST PER L.B. OF BOD REMOVED |
|------|--------------|------------|--------------------------|--------------------------|------------------------------|
| | | | * | | |
| 1962 | 148.7 | \$11416.75 | \$ 8.58 | \$ 77.30 | 2 CENTS |
| 1963 | 140.6 | \$14297.80 | \$10.45 | \$102.00 | 2 CENTS |
| 1964 | 172.3 | \$14024.94 | \$ 9.59 | \$ 81.39 | 3 CENTS |
| 1965 | 200.1 | \$14565.95 | \$ 9.98 | \$ 72.79 | 2 CENTS |
| 1966 | 199.5 | \$16479.72 | \$11.12 | \$ 82.62 | 2 CENTS |

* BASED ON ANNUAL POPULATION ESTIMATE AND 3.9 PERSONS PER FAMILY

1966 OPERATING COSTS



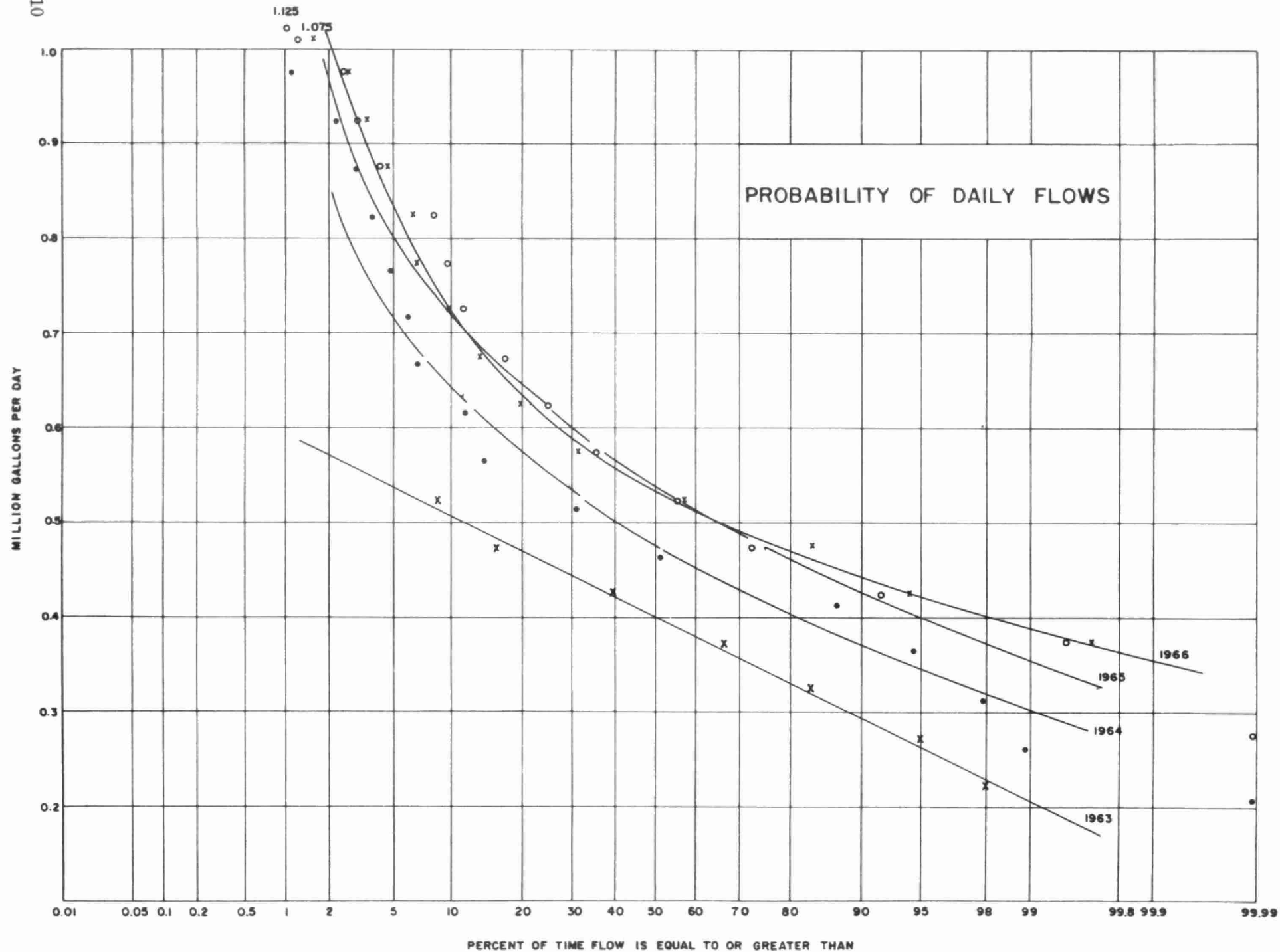
TOTAL ANNUAL COST



Process Data

During 1966, a total of 199.5 million gallons of raw sewage was treated at the Streetsville plant. This is a very slight decrease (0.3%) on that treated in 1965, and represents an average daily flow of 0.55 million gallons or 69% of the hydraulic capacity of the plant. The maximum twenty-four hour flow treated in 1966 occurred during the week of December 10-17 when a flow of 1.67 million gallons was recorded. The highest monthly average flows occurred in March.

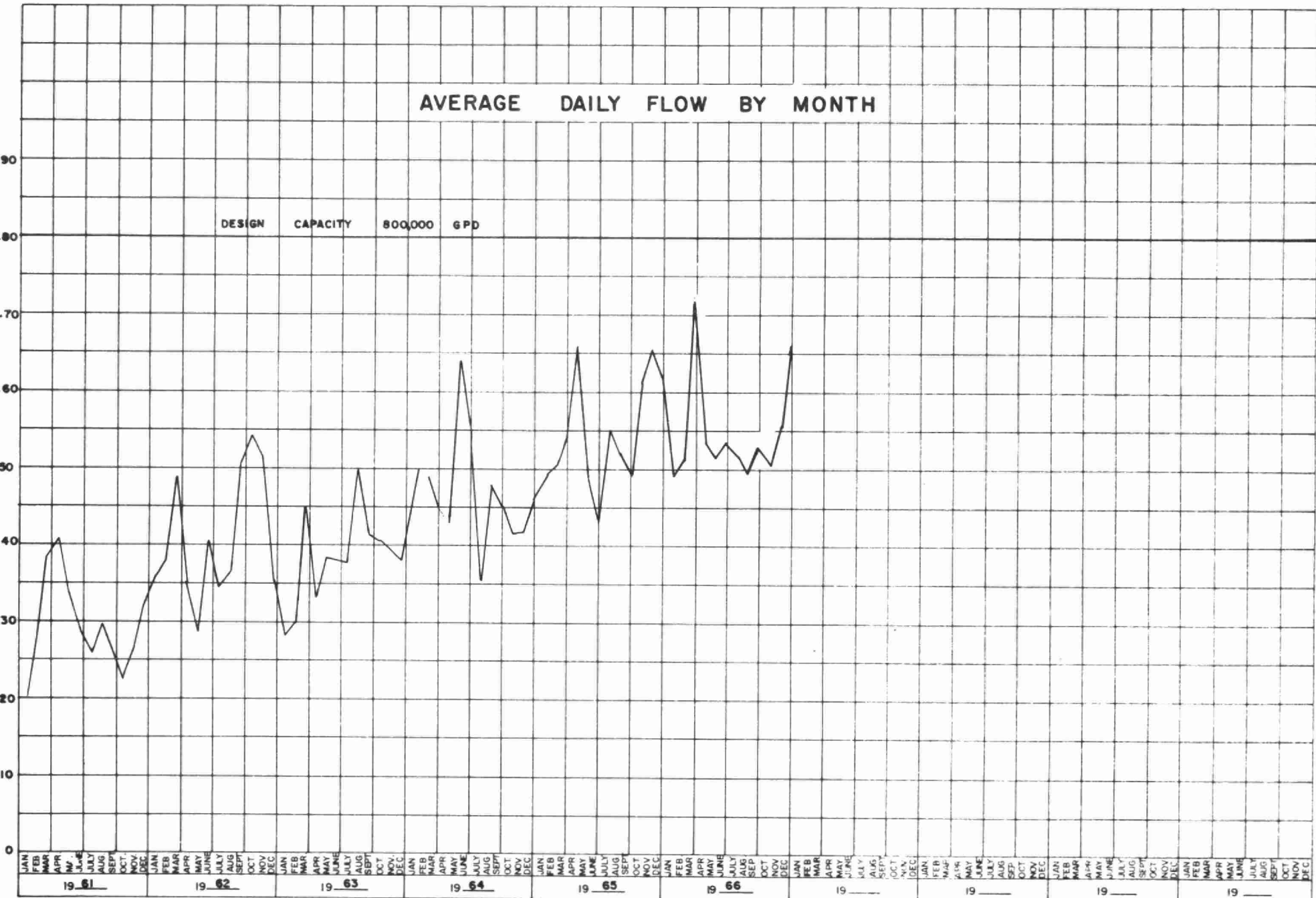
The plant is hydraulically overloaded 10% of the time.

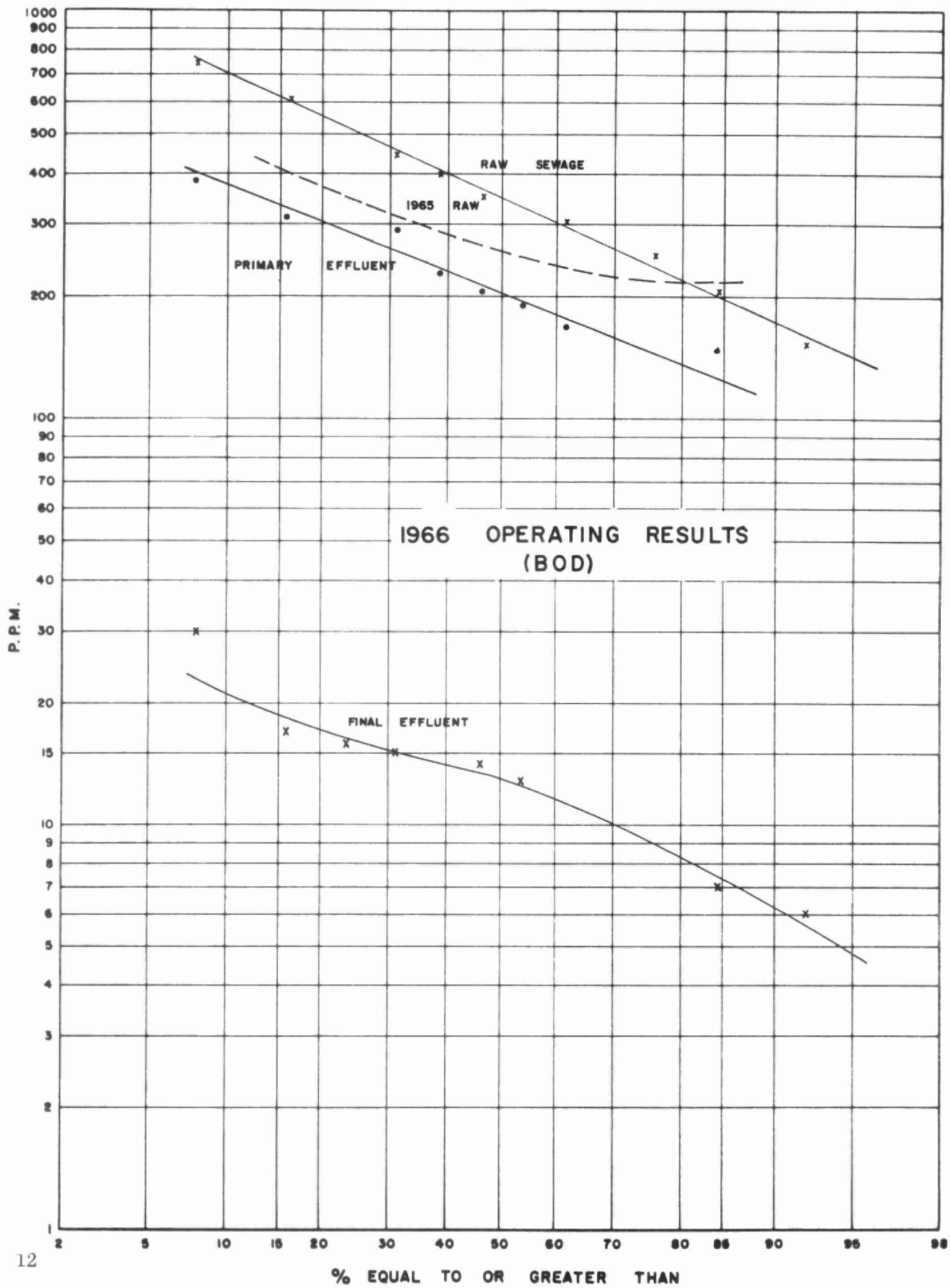


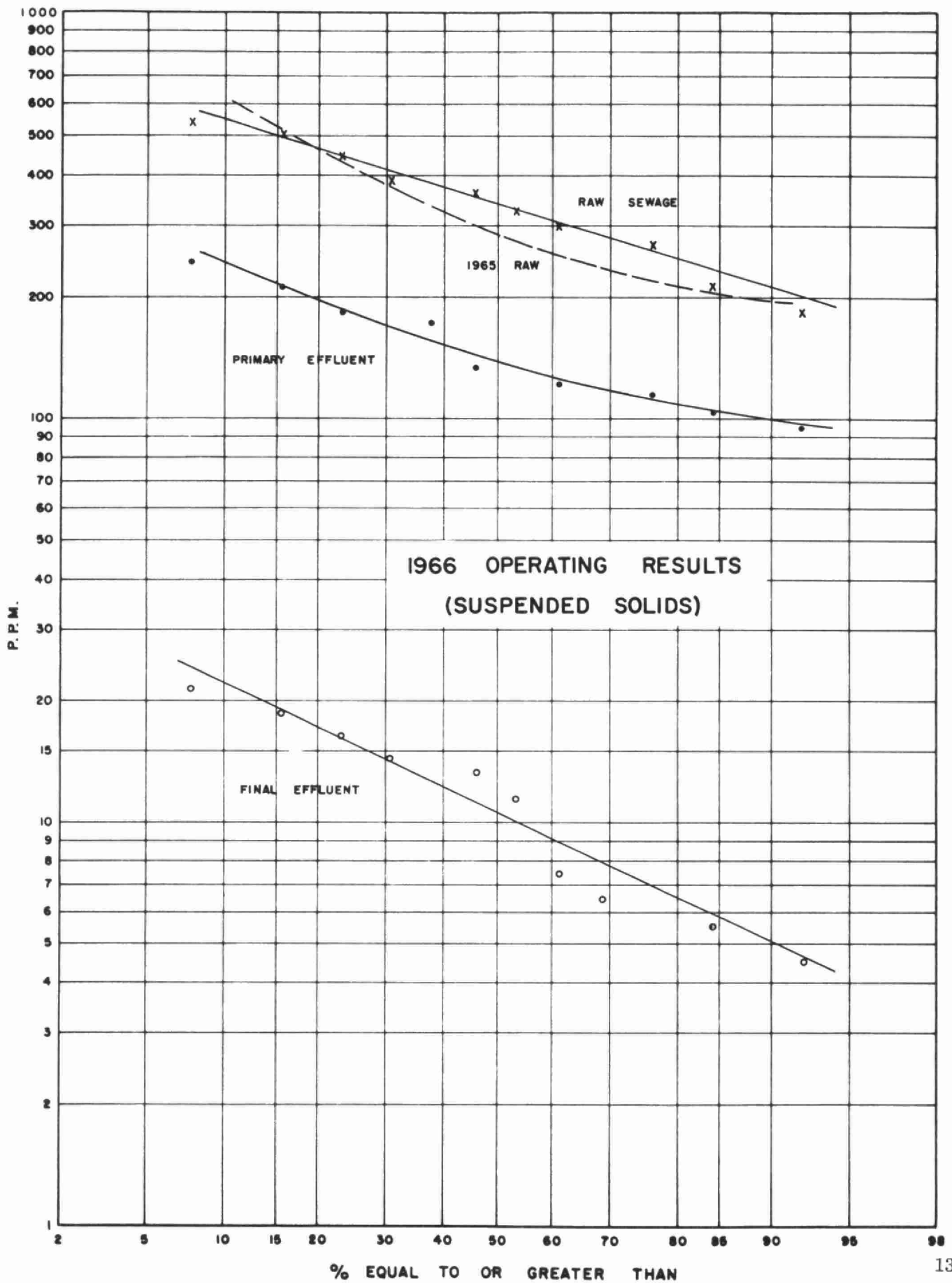
AVERAGE DAILY FLOW BY MONTH

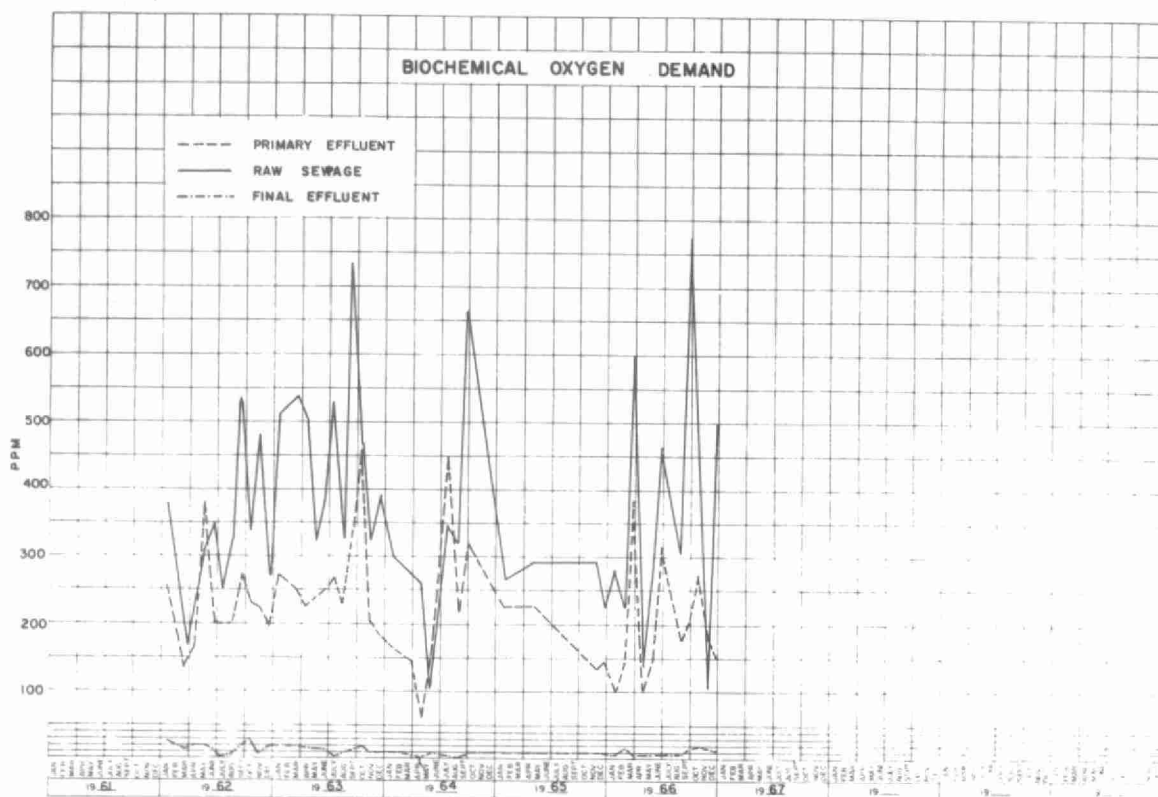
DESIGN CAPACITY 800,000 GPD

MGD

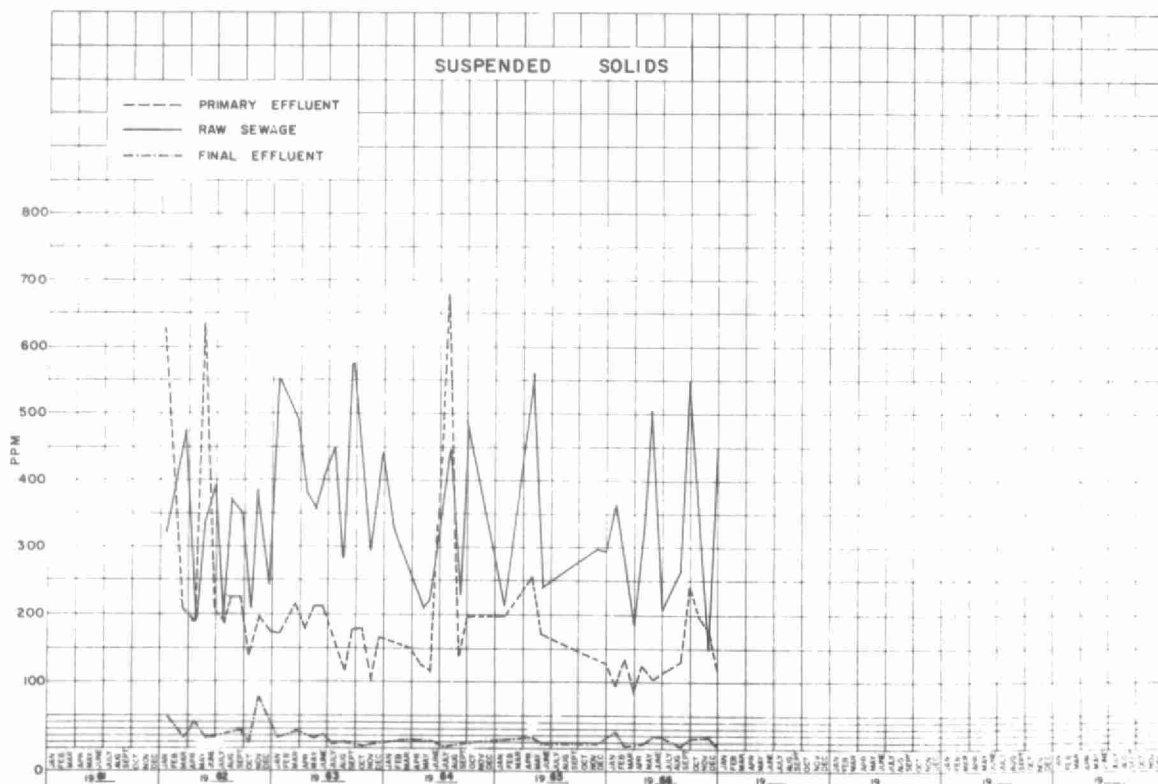








MONTHLY VARIATIONS



GRIT, B.O.D AND S.S. REMOVAL

| MONTH | B. O. D. | | | | S. S. | | | | GRIT REMOVAL CU. FT. |
|-------|------------------|------------------|----------------|-----------------|------------------|------------------|----------------|-----------------|----------------------------|
| | INFLUENT PPM. | EFFLUENT PPM. | % REDUCTION | TONS REMOVED | INFLUENT PPM. | EFFLUENT PPM. | % REDUCTION | TONS REMOVED | |
| JAN. | 280 | 6 | 98.0 | 20.8 | 354 | 22 | 94.0 | 25.1 | 10 |
| FEB. | 225 | 16 | 93.0 | 15.0 | 284 | 6 | 98.0 | 19.9 | 18 |
| MAR. | 600 | 7 | 98.5 | 65.6 | 172 | 6 | 96.5 | 18.4 | 13 |
| APR. | 134 | 7 | 94.5 | 10.2 | 316 | 8 | 97.5 | 24.7 | 8 |
| MAY | 265 | 7 | 97.5 | 20.4 | 506 | 17 | 96.5 | 38.8 | 10 |
| JUNE | 460 | 7 | 98.5 | 36.1 | 206 | 19 | 91.0 | 14.9 | 20 |
| JULY | *362 | 10 | 97.0 | 28.2 | *328 | 11 | 96.5 | 25.4 | 26 |
| AUG. | 300 | 5 | 98.5 | 22.4 | 266 | 2 | 99.0 | 20.0 | 18 |
| SEPT. | 780 | 15 | 98.0 | 60.4 | 544 | 12 | 97.5 | 42.0 | 16 |
| OCT. | 360 | 20 | 94.5 | 26.8 | 366 | 12 | 96.5 | 28.0 | 41 |
| NOV. | 108 | 13 | 88.0 | 7.9 | 156 | 14 | 91.0 | 11.9 | 34 |
| DEC. | 470 | 14 | 97.0 | 46.8 | 442 | 5 | 99.0 | 44.8 | 26 |
| TOTAL | - | - | - | 351.0 | - | - | - | 316.2 | 240 |
| AVG. | 362 | 10 | 97.0 | 29.2 | 328 | 11 | 96.5 | 26.4 | 20 |

* Average value substituted. No sample.

COMMENTS

The overall treatment efficiency was excellent, with approximately 97% removal of BOD and SS.

AERATION TANK RESULTS

1000 LBS. BOD TO AERATION

LBS BOD/100 LBS MLSS

JAN 19 61 FEB 19 61 MAR 19 61 APR 19 61 MAY 19 61 JUNE 19 61 JULY 19 61 AUG 19 61 SEPT 19 61 OCT 19 61 NOV 19 61 DEC 19 61 JAN 19 62 FEB 19 62 MAR 19 62 APR 19 62 MAY 19 62 JUNE 19 62 JULY 19 62 AUG 19 62 SEPT 19 62 OCT 19 62 NOV 19 62 DEC 19 62 JAN 19 63 FEB 19 63 MAR 19 63 APR 19 63 MAY 19 63 JUNE 19 63 JULY 19 63 AUG 19 63 SEPT 19 63 OCT 19 63 NOV 19 63 DEC 19 63 JAN 19 64 FEB 19 64 MAR 19 64 APR 19 64 MAY 19 64 JUNE 19 64 JULY 19 64 AUG 19 64 SEPT 19 64 OCT 19 64 NOV 19 64 DEC 19 64 JAN 19 65 FEB 19 65 MAR 19 65 APR 19 65 MAY 19 65 JUNE 19 65 JULY 19 65 AUG 19 65 SEPT 19 65 OCT 19 65 NOV 19 65 DEC 19 65 JAN 19 66 FEB 19 66 MAR 19 66 APR 19 66 MAY 19 66 JUNE 19 66 JULY 19 66 AUG 19 66 SEPT 19 66 OCT 19 66 NOV 19 66 DEC 19 66 JAN 19 67 FEB 19 67 MAR 19 67 APR 19 67 MAY 19 67 JUNE 19 67 JULY 19 67 AUG 19 67 SEPT 19 67 OCT 19 67 NOV 19 67 DEC 19 67 JAN 19 68 FEB 19 68 MAR 19 68 APR 19 68 MAY 19 68 JUNE 19 68 JULY 19 68 AUG 19 68 SEPT 19 68 OCT 19 68 NOV 19 68 DEC 19 68 JAN 19 69 FEB 19 69 MAR 19 69 APR 19 69 MAY 19 69 JUNE 19 69 JULY 19 69 AUG 19 69 SEPT 19 69 OCT 19 69 NOV 19 69 DEC 19 69 JAN 19 70 FEB 19 70 MAR 19 70 APR 19 70 MAY 19 70 JUNE 19 70 JULY 19 70 AUG 19 70 SEPT 19 70 OCT 19 70 NOV 19 70 DEC 19 70

AERATION SECTION

| MONTH | PRIM. EFFL. B.O.D. PPM. | M.L.S.S. PPM. | LBS. BOD. PER 100 LBS. M. L. S. S. | CUBIC FEET AIR PER LB. BOD. REMOVED |
|-----------|----------------------------|------------------|---------------------------------------|---|
| JANUARY | 100 | 2902 | 7 | 3124 |
| FEBRUARY | 144 | 1916 | 15 | 2199 |
| MARCH | 400 | 1829 | 61 | 512 |
| APRIL | 100 | 2132 | 10 | 2888 |
| MAY | 146 | 2269 | 13 | 2020 |
| JUNE | 315 | 2138 | 31 | 879 |
| JULY | - | 2500 | - | - |
| AUGUST | 175 | 2402 | 14 | 1725 |
| SEPTEMBER | 205 | 2328 | 18 | 1089 |
| OCTOBER | 276 | 2589 | 21 | 745 |
| NOVEMBER | 185 | 1970 | 21 | 1011 |
| DECEMBER | 150 | 1947 | 21 | 1080 |
| TOTAL | - | - | - | - |
| AVERAGE | 200 | 2244 | 21 | 1570 |

COMMENTS

Air is supplied by fine bubble diffusion. The amount is constant and there is ample reserve as shown by the cubic feet of air per pound of BOD removed. The only time the facilities were taxed was during the canning season and during the high flows of March.

DIGESTER OPERATION

| Month | 1000's cu. ft. to Digesters | 1000's cu. ft. | |
|-----------|-----------------------------------|-------------------|--------------------|
| | | From Beds | Direct to Truck |
| January | 20.02 | 1.13 | 3.12 |
| February | 16.13 | 1.48 | - |
| March | 16.86 | 0.49 | 4.15 |
| April | 14.39 | 0.24 | 6.86 |
| May | 12.68 | - | 10.43 |
| June | 13.86 | 0.43 | 6.59 |
| July | 14.86 | - | 4.61 |
| August | 15.72 | 0.51 | 9.02 |
| September | 26.94 | - | 15.40 |
| October | 22.20 | - | 14.47 |
| November | 17.09 | - | 7.99 |
| December | 19.08 | - | 6.18 |
| Total | 209.83 | 4.28 | 88.82 |
| Average | 17.49 | 0.36 | 7.40 |

COMMENTS

The digester was not functioning properly due to ineffective mixing. Gas production for the boiler had to be supplemented by natural gas.

The amount of sludge handled reached a peak in September due to cannery wastes.

CHLORINATION

| MONTH | PLANT FLOW (MG) | POUNDS CHLORINE | DOSAGE RATE (PPM) |
|-----------|-----------------|-----------------|-------------------|
| JANUARY | 15,152 | (1) 264 | 1.93 |
| FEBRUARY | 14,305 | (2) 53 | 3.46 |
| MARCH | 22,142 | (3) 235 | 1.94 |
| APRIL | 16,016 | 434 | 2.71 |
| MAY | 15,864 | 590 | 3.72 |
| JUNE | 15,951 | 655 | 4.11 |
| JULY | 16,051 | (4) 433 | 3.80 |
| AUGUST | 15,178 | 701 | 4.62 |
| SEPTEMBER | 15,781 | 832 | 5.27 |
| OCTOBER | 15,791 | 712 | 4.51 |
| NOVEMBER | 16,727 | 609 | 3.64 |
| DECEMBER | 20,507 | 625 | 3.05 |
| TOTAL | 199,465 | 6143 | - |
| AVERAGE | 16,622 | 512 | 3.60 |

(1) 28 days' chlorination

(2) 3 days' chlorination

(3) 17 days' chlorination

(4) 22 days' chlorination

COMMENTS

The plant increased its use of chlorine in order to ensure a satisfactory chlorine residual.

Chlorination was practised whenever the outflow area was free of ice.

The increased use of chlorine resulted in higher chemical costs for 1966.



CONCLUSIONS

Operation was normal in 1966 and a highly efficient removal of pollution was achieved. The flow remained practically unchanged from 1965, although the BOD loading increased by 12%. Canning factories caused operational problems during the fall of 1966 due to the high strength of their wastes.

RECOMMENDATIONS

This plant is now operating loadings should be permitted

Consideration should be given at the canning factories to facilities.

Date Due

| | | | |
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